

Exhibit

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SANDISK CORPORATION,

Plaintiff,

v.

LEXAR MEDIA, INC.,

Defendant.

Case No. C98-01115 CRB (PJH)

LEXAR MEDIA, INC.'S REPLY IN
SUPPORT OF ITS MOTION FOR
PARTIAL SUMMARY JUDGMENT OF
INVALIDITY

Date: March 10, 2000
Time: 10:00 a.m.
Dept: 8
Judge: Hon. Charles H. Breyer

AND RELATED COUNTER-CLAIM.

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1 Defendant and counterclaimant Lexar Media, Inc. ("Lexar") submits this Reply Brief in
2 Support of its Cross-Motion for Summary Judgment of Invalidity of claim 10 of U. S. Patent
3 No. 5,602,987 ("the '987 patent"). Plaintiff SanDisk Corp. ("SanDisk") has presented no
4 questions of fact material to Lexar's motion. For the reasons set forth in its Motion and below,
5 Lexar is entitled to partial summary adjudication that claim 10 is invalid.

6 SanDisk Opposition to Lexar's Cross-Motion for Summary Judgment ("Oppn."), reduced
7 to its essence, is little more than an argument that Dr. Hsia and Dr. Gosney "conceded" that Dr.
8 Hsia's prior invention does not practice claim 10 of the '987 Patent. SanDisk claims that Hsia's
9 memory system is incapable of storing both user data and overhead data. SanDisk also claims
10 that Hsia admitted that its system that the Hsia system does not partition its memory array into "a
11 plurality of sectors." SanDisk also claims that Dr. Gosney conceded that the Hsia memory
12 system cannot meet the "floating gate" limitation of claim 10. Based upon these supposed
13 concessions, SanDisk claims that this Court must deny Lexar's motion. In reality no such
14 concessions were made by either Dr. Hsia or Dr. Gosney. To the contrary, SanDisk has
15 deliberately taken testimony out of context, and attempted to create the impression of
16 "concessions" where none exists. Finally, SanDisk claims that there is no corroboration for Dr.
17 Hsia's prior invention. This argument is made despite the fact that Hsia produced numerous
18 pages of notes as well as articles covering every aspect of his invention at his deposition. As the
19 following will show, Lexar is entitled to a finding that claim 10 of the '987 patent is invalid.

20 **I. SANDISK MISREPRESENTS THE RECORD, MISSTATES THE LAW AND**
21 **RAISES IRRELEVANT ARGUMENTS IN AN ATTEMPT TO DIVERT**
22 **ATTENTION FROM THE INVALIDITY OF CLAIM 10.**

23 Before proceeding further, it is necessary to address several frivolous arguments SanDisk
24 makes in an attempt to create a factual dispute where none exists. First, SanDisk attempts to
25 divert attention from the actual basis for finding claim 10 of the '987 patent invalid by refuting
26 "straw man" arguments never raised by Lexar and irrelevant to the decision of this motion. For
27 instance, SanDisk spends substantial space in its opposition on the irrelevant assertion that Dr.
28 Hsia "never built" the prior art system disclosed in his lecture notes. *See Oppn. at 4.* To qualify
as invalidating prior art, the invention disclosed in a printed publication need not have actually

1 been made. *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985). The issue is whether the
2 anticipating Hsia system was “known . . . by others in this country,” or “described in a printed
3 publication in this or a foreign country” before the invention of the ‘987 patent. 35 U.S.C.
4 § 102(a).

5 Similarly, SanDisk spends all of page 5 erecting and knocking down another straw man,
6 arguing that the ‘987 patent is not anticipated or rendered obvious by certain Intel Corporation
7 and Seeq Technology publications. Lexar *never asserted* that those publications invalidate the
8 ‘987 patent, and indeed, *did not submit them in support of this motion*. In addition, SanDisk
9 repeatedly states that its asserted secondary considerations “demonstrate the novelty of claim 10.”
10 Opp. at 17; *see also id.* at 18; *id.* at 20. Commercial success cannot establish “novelty” under
11 section 102 and thus is irrelevant to the “novelty” analysis. *See, e.g., Marconi Wireless*
12 *Telegraph Co. v. United States*, 320 U.S. 1, 35 (1943) (“Commercial success achieved by the later
13 inventor and patentee cannot save his patent from the defense of anticipation by a prior
14 inventor.”). Finally, SanDisk’s assertion at page 14 of its brief that the Hsia reference “teaches
15 away” from the invention of claim 10 is also irrelevant to whether Hsia anticipates claim 10 under
16 35 U.S.C. § 102. *See Celeritas Tech., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed.
17 Cir. 1998) (“A reference is no less anticipatory if, after disclosing the invention, the reference
18 then disparages it. Thus, the question of whether a reference ‘teaches away’ from the invention is
19 inapplicable to an anticipation analysis.”).

20 Having attempted to divert the Court’s attention from the actual issues, SanDisk then tries
21 to substitute its own definition of the “Hsia memory system” for the disclosure of the invalidating
22 document: *Dr. Hsia’s lecture notes*. SanDisk refers repeatedly to Dr. Hsia’s “memory system,”
23 which it equates only with the preferred embodiment disclosed in Dr. Hsia’s U.S. Patent No.
24 4,398,248 (“the ‘248 patent”).¹ To be certain the record is clear, the ‘248 patent is incorporated

25 ¹ Reviewing the copy of the ‘248 patent attached as Exhibit D to Dr. Hsia’s Declaration,
26 Lexar realized that it is difficult to read. Lexar therefore provides a clear copy of that patent,
27 along with its Certificate of Correction, as Exhibit A to the Supplemental Declaration of Sean P.
28 DeBruine in Support of Lexar’s Motion for Summary Judgment of Invalidity. (“Supp. DeBruine
Decl.”) filed herewith.

1 by reference, and therefore is part of Dr. Hsia's lecture notes. However, it is the notes in their
2 entirety including the patent and an earlier published article, that constitutes invalidating the
3 disclosure. Taken in their entirety for what they disclose to one skilled in the relevant art, Dr.
4 Hsia's notes anticipate claim 10.

5 SanDisk's next trick is an attempt to rewrite claim 10, importing limitations that are
6 simply not present under the Court's claim construction ruling. For instance, SanDisk re-defines
7 the term "array" to mean a single flash memory chip. Oppn. at 12-13. That definition is nowhere
8 in the claim nor in the Court's claim construction. SanDisk gives the same treatment to the terms
9 "partition" and "nonvolatile memory sector." *Id.* Finally, SanDisk apparently deliberately
10 misrepresents testimony to establish the "admissions" allegedly made by Lexar. When the
11 testimony is examined, it is clear that no such admissions were made. SanDisk's conduct in
12 claiming that "admissions" were made is the best evidence that its opposition is without merit.

13 **II. CLAIM 10 IS ANTICIPATED BY DR. HSIA'S LECTURE NOTES.**

14 **A. SanDisk Does Not Contest That the Hsia Notes Disclose a Disk Emulation**
15 **System In Which a Nonvolatile Semiconductor Memory Array and Controller**
16 **Are Provided On a Removably Connectible Card.**

17 While spending pages implying that Hsia's system has nothing in common with claim 10
18 of the '987, in reality SanDisk is forced to admit that the systems are essentially the same.
19 SanDisk does not dispute, either in its declarations or its brief, the following facts:

- 20 • SanDisk does not dispute that Dr. Hsia's notes disclose a solid-state, nonvolatile
21 mass memory system that emulates a disk drive;
- 22 • SanDisk does not dispute that the memory system disclosed by Dr. Hsia includes an
23 array of nonvolatile memory cells and a controller;
- 24 • SanDisk does not dispute that the array of nonvolatile memory cells in Dr. Hsia's
25 system are organized into a plurality of blocks of cells that can be erased together as
26 a unit;

- SanDisk does not dispute that the Hsia notes disclose providing the memory array and the controller on a card that is removably connectable to a host computer;² and
- SanDisk does not dispute that in response to commands from the host computer, the mass memory system disclosed by Dr. Hsia reads and writes user data.

As explained below, Sandisk's attempts to create differences between claim 10 and Hsia's disclosure are unavailing. The disclosure of every element of claim 10 in the Hsia lecture notes is summarized in the chart attached hereto at Tab A.

B. The Hsia Notes Disclose Partitioning The Memory Array into Sectors as Defined by the Court.

SanDisk claims that Dr. Hsia's notes do not disclose "an array of nonvolatile . . . memory cells partitioned into a plurality of sectors." Oppn. at 11-12. This argument ignores both the actual words used in claim 10 and the Court's construction of those words. It also utterly mischaracterizes the express teaching of Dr. Hsia's notes, substituting an alleged "admission" by Dr. Hsia for the facts. *Id.* at 11.

Claim 10 requires "*an array*" of memory cells. SanDisk does not contest that this array may be made up of multiple "chips." Nor can SanDisk dispute that such chips themselves often contain two or more sub-arrays. *See* Supp. DeBruine Decl., Ex. F, Fig. 5 (Toshiba 4mb Flash chip comprising four 1mb arrays). Thus, the "an array" limitation refers simply to a number of addressable memory cells provided on the memory card. It does not limit in any way how those memory cells are to be structured.

In addition, the claim language requires only that this single array be partitioned into at least two "sectors." The Court has already defined "nonvolatile memory sector" as the basic unit of erase within the array. The claim requires a plurality, e.g. at least two such groups of cells that can be erased together as a unit. Thus, as has already been briefed and decided by the Court, if the overall array, which may consists of more than one chip, is divided into at least two sectors of

² SanDisk points out that the drawing showing Dr. Hsia's memory system mounted on a removable card came from an earlier document written by Dr. Hsia proposing to mount a missile guidance computer on removable cards. However, one skilled in the art, reviewing Dr. Hsia's notes, which are directed almost exclusively to his mass memory system, would understand that such a memory system could be mounted on a single removable card as illustrated.

1 erase, this limitation is met. Therefore, a system composed of only two "chips," each of which
2 was erasable only in its entirety, would be within the plain language of claim 10.³

3 SanDisk's argument is a blatant attempt to re-write claim 10. SanDisk would have the
4 Court insert the word "chip" in place of "array." See Oppn. at 12 ("The '987 Patent Requires that
5 Each Array *or Chip* to Be Partitioned . . ."). In other words, SanDisk's argument is based upon
6 the assumption that this claim limitation really reads "*one or more flash memory chips, each chip*
7 *partitioned into sectors erasable together as a unit.*" Oppn. at 12-13. Unfortunately for SanDisk,
8 the word "chip" does not appear in the claim at issue. SanDisk's importation into the claim of a
9 limitation found only in the specification is erroneous as a matter of law. *E.I. du Pont de*
10 *Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430 (Fed. Cir.), *cert. denied*, 488 U.S. 986
11 (1988). Under the construction of the words actually appearing in claim 10, as construed by the
12 Court, SanDisk's argument fails as a matter of law.

13 Even if SanDisk's impermissible claim construction were adopted, the Hsia lecture notes
14 would still anticipate claim 10. The Hsia notes do not disclose separate "chips" each of which is
15 erased in its entirety. As described in Fig. 1, *infra*, Rather, Dr. Hsia disposes a large number of
16 sub-arrays ("MAs") on a silicon wafer. Those sub-arrays are interconnected in silicon. Those
17 sub-arrays are not operated separately; rather, eight to ten such arrays are used together to store a
18 single data word. Supp. DeBruine Decl., Ex. A at 9:7-11. The Hsia reference, in its preferred
19 embodiment, discloses packaging 224 such sub-arrays in a memory "slice," which consists of a
20 14 row by 16 column matrix of such arrays. '248 patent at 10:7-20; Fig. 6. It is this memory
21 "slice" that constitutes a chip as used by SanDisk. Moreover, even were the wafers left whole,
22 and not sliced, the result would be a non-volatile memory array. Dr. Hsia's notes disclose that a
23 whole wafer in his system is effectively a single "chip" as that term is used by SanDisk.

24
25 ³ SanDisk's cite to the patent's discussion of the Intel chip-erasable flash is not persuasive.
26 Oppn. at 13. That passage discusses the inefficiency of having an erase sector larger than the disk
27 sector to be emulated. ("If not all the information in the chip is to be erased, the information must
28 first be temporarily saved, and is usually written to another memory (typically RAM). The
information is then restored into the non-volatile memory by programming back into the device.
This is very slow and requires extra memory as holding space.") Because claim 10 expressly
anticipates that the nonvolatile memory sector may store any number of disk sectors, it expressly
allows for such inefficiency.

See Supp. DeBruine Decl., Ex. B, Fig. 1; see also Hsia Decl., Ex. G at LEX08543.

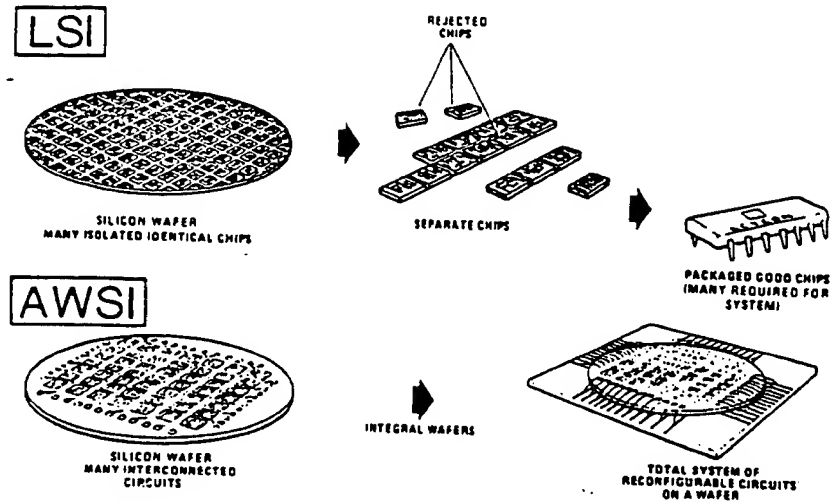


Fig. 1. Conventional integrated circuit packaging versus wafer-scale integration packaging.

SanDisk cannot dispute that Dr. Hsia discloses that each slice or wafer contains “an array of nonvolatile . . . memory cells.” Nor can SanDisk dispute that the array disclosed each such array is “partitioned” into groups of cells, each of which is erasable together as a unit. As the ‘248 patent states: “The ERASE command erases a block of 4,096 words of data.” Supp. DeBruine Decl. Ex. A at 6:12-13. Those 4,096 data words are stored in eight sub-arrays in the preferred embodiment (10 sub-arrays if a two bit ECC code is stored with each word). Thus a “block” is a group of eight sub-arrays, out of the total of 224 or more arrays, which can be erased together as a unit. *Id.* at 9:7-12. That each memory slice constitutes an array partitioned into sectors is illustrated in the diagram attached at Tab B, showing the array in Fig. 5 at the ‘248 patent partitioned into blocks of erase.

Thus, SanDisk’s argument that the Hsia reference does not disclose “an array of non-volatile . . . memory cells partitioned into sectors” is erroneous as a matter of law and contrary to the undisputed facts. That Dr. Hsia stated that each sub-array is conceptually like a separate chip does not change the disclosure of providing a array of memory cells partitioned into groups erasable together as a unit.

1 C. **Dr. Hsia Discloses Partitioning Sectors into User Data and Overhead Portions.**

2 SanDisk's selective and misleading use of Dr. Hsia's deposition testimony, and attempt to
3 ignore the actual disclosure of Dr. Hsia's lecture notes, is nowhere more apparent than in its
4 disingenuous claim that Dr. Hsia "conceded" that the notes do not disclose storing user data and
5 overhead in the same nonvolatile memory sector. Oppn. at 11. Dr. Hsia made no such
6 "concession." The testimony cited by SanDisk refers *only to the preferred embodiment* disclosed
7 in the '248 patent. Supp. DeBruine Decl., Ex. B (Hsia Depo. at 49-51). As Dr. Hsia explained to
8 SanDisk:

9 A: This ['248] patent – *this particular example system* was designed
10 specifically – or proposed specifically to a customer that are interested in that. . .
11 We have other customers who actually have designed the EDAC system
12 requirement into the memory systems, and just we happen to pull this example
13 that is not including the EDAC.

14 *Id.* at 51:7-14. Thus, while the example given in the preferred embodiment of the '248 patent
15 does not provide for overhead in each sector, the patent explicitly discloses an alternate
16 embodiment which does include additional memory cells in each sector to store EDAC (ECC)
17 codes. Supp. DeBruine Decl., Ex. A at 9:67-10:5; Fig. 5. SanDisk invites legal error by
18 attempting to restrict Dr. Hsia's disclosure to the preferred embodiment in the '248 patent.
19 *Ultradent Prods., Inc. v. Life-Like Cosmetics, Inc.*, 127 F.3d 1065, 1068 (Fed. Cir. 1997) (court
20 erred by construing disclosure of prior art as limited to the preferred embodiment).

21 In Dr. Hsia's system, each bit of a data word is stored in a separate sub-array, all of which
22 are controlled by an associated decoder. DeBruine Supp. Decl., Ex. B (Hsia Depo.) at 45:20-
23 47:22. Dr. Hsia testified that it would be "understood readily" by one skilled in the art how to
24 implement the optional ECC disclosed in the patent. *Id.* at 50:3-16. To do so, one would simply
25 provide additional sub-arrays to store two additional bits of ECC code. "... [B]ecause we're bit
26 organized – so, for example . . . So for one you might have 2 bits – 2 parity bits – and then in this
27 case now [instead of] accessing the 8 arrays, you access 10 arrays." *Id.* at 53:8-16; *see also id.* at
28 83:20-84:15 ("... ECC codes are very easily implemented by simple additions of another array

1 in connection with the data that was being put together.”); 84:23-85:2 (...”the ECC code is just
2 an additional bit column to be used with the memory rates [*sic* ‘arrays’]”).

3 Dr. Hsia further explained that, although it might be technically feasible to store the ECC
4 codes separate from the user data, to do so would present a much more difficult design challenge,
5 and would make no sense at all.

6 Q: So if I understand it correctly, your testimony is that you’re not aware
7 of any logical reason why you would erase the ECC separate from the data.

8 A: The ECC code associated with the word; that’s correct.

9 *Id.* at 99:10-14. That testimony is confirmed by Dr. Gosney. DeBruine Decl., Ex. C. (Gosney
10 Depo. at 117:22-118:6)

11 Thus, Dr. Hsia in no way “conceded” that his lecture notes, which included the full
12 disclosure of the ‘248 patent, did not disclose the storage of overhead along with user data in the
13 nonvolatile memory sectors. Rather, Dr. Hsia repeatedly affirmed that the disclosure in the
14 incorporated patent was more than sufficient to disclose such a partitioning of the sector to one of
15 skill in the art.

16 SanDisk fails to recognize that, under the law, that is all that is required for a reference to
17 anticipate. A prior art disclosure is sufficient “if one of ordinary skill in the art could have
18 combined the publication’s description of the invention with his own knowledge to make the
19 claimed invention.” *In re Graves*, 69 F.3d at 1152. In *Graves*, the Federal Circuit upheld a
20 finding of anticipation where the cited reference did not specifically disclose a claim element,
21 because that claim element was “within the knowledge of a skilled artisan.” *Id.* at 1152. As the
22 testimony of both Dr. Hsia and Dr. Gosney make clear, the disclosure in the ‘248 patent was
23 sufficient to disclose to the skilled artisan the storage of overhead (ECC codes) along with the
24 user data to which they relate in the same nonvolatile memory sector.⁴

25 Moreover, there is an express disclosure in Dr. Hsia’s notes of storing extra bytes for ECC

26 _____
27 ⁴ This is also true because Dr. Hsia’s system expressly emulates a disk drive, and disk
28 drives have long stored overhead with user data Gosney Decl., ¶¶ 23-25. One skilled in the art
would be very familiar with that fact. *Id.* ¶34.

codes along with user data in each nonvolatile memory sector. *Id.*, Ex. B at 50:23-51:14; 56:8-11. Again, SanDisk chooses to ignore that express disclosure, in favor of its unsupported and largely immaterial assertions regarding witnesses' alleged "concessions." As Dr. Hsia repeatedly explained, he and his team had in fact designed a nonvolatile mass memory system which did store user data and overhead together in the same nonvolatile memory sector. Dr. Hsia also noted that the design of that system was disclosed in an article incorporated by reference into his lecture notes. *Id.* at 86:9-16. SanDisk was specifically advised as to the document Dr. Hsia was referring to. *Id.* at 61:15-20. SanDisk chose to not question Dr. Hsia regarding that article, likely because it is fatal to SanDisk's patent.

Dr. Hsia's 1979 article entitled "Adaptive Wafer Scale Integration," is expressly referred to and incorporated into his lecture notes. Hsia Decl., Ex. G at LEX08553. That article expressly discloses a system that did employ error detection and correction. Supp. DeBruine Decl., Ex. C at LEX02197, Fig. 7. The mass memory system described in that article stored user data in sectors of 512 bytes each. *Id.* at 199, Table I (64 words X 64 bits = 4096 bits or 512 bytes.) However, the actual storage of each erase block was 4k plus 512 bits (512 bytes plus 64 bytes.) *Id.* at 197, Fig. 7 (64 words X 72 bits). These extra eight bits per word are the ECC codes. *Id.* Therefore, the memory array of that system stored 0.5×10^9 bits of user data and *code bits*. *Id.* This express teaching shows not only that the memory is partitioned, but also that each sector is divided into user data and overhead.

C. SanDisk Ignores Dr. Hsia's Express Disclosure of Floating Gate Memory Cells.

SanDisk's next argument, that the Hsia notes do not disclose the use of floating gate memory cells, simply ignores the document. See Oppn. at 15-16. To support its meritless claim SanDisk cites the alleged "admission" of Dr. Gosney. *Id.* The "admission" concerned the fact that the '248 *patent* did not disclose use of floating gate cells. Gosney Decl., ¶ 31. Dr. Gosney's declaration goes on to explain that Dr. Hsia's notes do disclose the use of floating gate cells. *Id.* at ¶ 36. SanDisk therefore ignores the fact that Dr. Hsia's lecture notes expressly disclose the use of floating gate EEPROM memory cells. The Hsia lecture notes discuss Dr. Hsia's concept of

1 wafer-scale, reconfigurable systems. The first application of that concept, and the application
2 discussed in great detail in those notes, is a mass memory system. Hsia Decl., Ex. G at
3 LEX08556-8574. After discussing the mass memory concept in considerable detail, including the
4 incorporation of the '248 patent disclosure, the notes address design considerations. One such
5 consideration is "Process." *Id.* at LEX08583. With regard to non-volatile semiconductor
6 memory applications ("NVSM"), the process choices are between the MNOS process as
7 discussed in the '248 patent, and the floating gate EEPROM process. *Id.* Thus, Dr. Hsia's notes
8 expressly disclose and teach the use of floating gate memory arrays in the context of Dr. Hsia's
9 mass memory system. Dr. Gosney stated as much in his declaration. Gosney Decl., ¶ 36. Thus
10 there is no factual support for SanDisk's claimed admission.

11 Nor can SanDisk contest the adequacy of the express disclosures of floating gate memory
12 cells. Adequacy of the disclosure is measured by the knowledge of one of ordinary skill in the
13 art. *In re Graves*, 69 F.3d at 1152. SanDisk does not, and cannot, dispute that those even
14 nominally skilled in the art would know that floating gate EEPROM cells could be, and should
15 be, substituted for MNOS memory cells. Gosney Decl., ¶¶ 15-16. SanDisk does not challenge
16 that those skilled in the art would know how to design such a system using floating gate memory
17 cells. Thus, the express teaching in the Hsia notes discloses the implementation of Dr. Hsia's
18 system with floating gate memory cells to one skilled in the art.

19 **D. Dr. Hsia's Prior Invention is Corroborated By Written Material.**

20 SanDisk's assertion that there is no documentary corroboration of Dr. Hsia's prior
21 invention of the method of claim 10 ignores both the foregoing documents and the very
22 documents SanDisk used as exhibits at its deposition of Dr. Hsia. Exhibit 145 of the Hsia
23 deposition, described in detail the embodiment of his mass memory system that included an 8-bit
24 ECC code stored along with each 64 bit data word in the nonvolatile memory sector. Supp.
25 DeBruine Decl., Ex. B (Hsia 145); Ex. A (Hsia Depo at 98:16-99:3) ("Okay. The way ECC
26 works is that for each word-let's say that in this case, you know, 64-bit long, there will be an 8-bit
27 ECC code...that is attached to the word. And in the normal operation, when you want to erase
28 the data associated-that particular data, then you automatically erase all of the ECC code;

1 otherwise, the ECC code have no meaning anyway. So you erase together in conjunction with
2 that.”) The documents and the testimony by Hsia, refute SanDisk’s claim and provide further
3 support that this motion must be granted.

4 **III. CLAIM 10 IS OBVIOUS IN LIGHT OF THE HSIA PATENT AND THE IBM**
5 **REFERENCE.**

6 **A. Because SanDisk’s Anticipation Arguments are Meritless, It’s Opposition to**
7 **Obviousness Also Fails.**

8 In opposition to Lexar’s proof that claim 10 of the ‘987 patent would have been obvious in
9 light of the Hsia ‘248 patent or the ‘248 patent and the IBM Technical Disclosure Bulletin,
10 SanDisk simply restates its arguments regarding the preferred embodiment of the Hsia patent. In
11 particular, SanDisk claims that the Hsia ‘248 patent does not disclose partitioning the memory
12 array into a plurality of sectors, and does not disclose storing both user data and overhead in each
13 sector. Oppn. at 16. However, as demonstrated above, those arguments are factually and legally
14 meritless.

15 It is therefore undisputed that the only elements of claim 10 not expressly disclosed in the
16 ‘248 patent are 1) forming the memory array with floating gate, rather than MNOS memory cells;
17 and 2) mounting the memory array and the controller on a removably-connectable card.

18 The IBM reference expressly discloses the use of floating gate memory cells in a disk
19 emulation system. In addition, the IBM reference discloses mounting the disk emulation system
20 on a single, removable card. Thus, the combination of the ‘248 patent with the IBM reference
21 discloses every element of claim 10.

22 An additional basis supporting Lexar’s position is Dr. Gosney’s uncontroverted testimony
23 that floating gate cells were commonly understood as substitutes for MNOS cells.

24 SanDisk’s only attempt to rebut this clear showing is to misrepresent its own expert’s
25 declaration. In particular, SanDisk states that “the IBM article and the Hsia references do not
26 provide sufficient information to individuals of ordinary skill to suggest or disclose the invention
27 of claim 10.” Oppn. at 16. In support of this statement, SanDisk cites only to paragraph 86 of Dr.
28 Hoff’s Declaration. *Id.* In that paragraph, however, Dr. Hoff simply makes the unsupported
assertion that the IBM article would not, in and of itself, enable one of ordinary skill in the art to

1 practice claim 10. Again, SanDisk is refuting arguments never raised; if the IBM article by itself
2 disclosed the entire alleged invention, Lexar would have moved for anticipation on that ground as
3 well. Nowhere does Dr. Hoff claim, as stated by Lexar, that one of skill in the art would not
4 know to supplement the allegedly " cursory " disclosure of the IBM reference, Hoff Decl., ¶ 86,
5 with the detailed disclosure of the Hsia '248 patent and build a removable flash memory card for
6 disk emulation. He does not because he cannot. Claim 10 is clearly invalid as obvious in light of
7 these references.

8 **B. SanDisk Has Failed to Establish Any "Secondary Considerations" to**
9 **Overcome the Obviousness of Claim 10.**

10 SanDisk's purported evidence of secondary considerations, which is relevant only to
11 Lexar's argument on obviousness, fails to create any issue of material fact to overcome the clear
12 obviousness of claim 10 of the '987. While such secondary considerations are relevant to the
13 question of obviousness they do not control in a case such as this, where primary considerations
14 establish a "strong case of obviousness based on admissions and teachings of the prior art."
15 *Newell Companies, Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 769 (Fed. Cir. 1988). Dr. Hsia's
16 lecture notes, as well as the combination of Dr. Hsia's '248 patent with the 1986 IBM Technical
17 Disclosure, render claim 10 obvious regardless of any evidence of commercial success or other
18 secondary considerations.

19 To carry its burden of proof on this issue, SanDisk is required to show a nexus between
20 the invention as claimed and the asserted secondary considerations. *Sjolund v. Musland*, 847 F.2d
21 1573, 1582 (Fed. Cir. 1988). "Commercial success is relevant only if it flows from the merits of
22 the claimed invention.") *Id.* SanDisk has failed to present any evidence linking any aspect of the
23 alleged invention as claimed to the commercial success or commercial acquiescence. This failure
24 creates a gap in the chain of causation, rendering SanDisk's purported evidence of secondary
25 considerations irrelevant.

26 SanDisk cannot show a nexus between the inventions of claim 10 and the commercial
27 success of its products in light of its own witnesses' testimony. Dr. Hoff attributed the success of
28 SanDisk's products to features not present in claim 10—the small size and weight of

1 CompactFlash cards, their speed, and their capacity for wear-leveling to increase endurance. *See*
2 Opposition at 2-3; Hoff Decl. in Support of SanDisk's Motion for Partial Summary Judgment, ¶¶
3 23-29. SanDisk's founder and president, Eli Harrari, confirms that endurance is a critical factor in
4 the success of flash memory cards. Harrari Decl., ¶12. Mr. Harrari adds another factor—the high
5 cost of flash EEPROMS in 1989. *Id.* Again, these factors are entirely absent from claim 10.⁵ By
6 SanDisk's own admissions, features not claimed in the patent explain the success of SanDisk's
7 (and Lexar's) products, including the many other patented inventions incorporated in these
8 products.⁶ This fatal disconnect between the inventions of claim 10 and SanDisk's purported
9 commercial success defeats any inference of non-obviousness.

10 Additionally, sales figures alone are insufficient to establish the existence of commercial
11 success. SanDisk touts its success as a company as well as its sales in "flash memory systems"
12 since 1995 as evidence of the commercial success of claim 10. However, SanDisk relies on
13 evidence of its sales of all of its "flash memory systems," which admittedly include products that
14 do not even practice claim 10. *See Oppn.* at 17; Harari Decl. ¶17. SanDisk's bald assertion that
15 most of its products incorporate the inventions of claim 10 cannot resolve this defect. Similar
16 evidence has been repeatedly rejected by the Federal Circuit as insufficient. *See, e.g., In re*
17 *Baxter Travenol Labs.* 952 F.2d 388, 392 (Fed. Cir. 1991) (evidence of percentage of sales
18 insufficient to demonstrate commercial success); *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1151
19 (Fed. Cir. 1983) (evidence of number of units sold insufficient to demonstrate commercial
20 success). SanDisk presents no evidence of market share or growth in market share. Nor does it
21 specifically identify and quantify the sales of products actually incorporating claim 10.
22 Furthermore, SanDisk presents no evidence of commercial success until 1995—seven years after
23

24 ⁵ SanDisk also attempts to rely on Lear's sales as indicative of commercial success.
25 However, that puts the cart before the horse; SanDisk has not proven that any Lexar products
even practice claim 10, much less that the features claimed have anything to do with those sales.

26 ⁶ The '987 patent includes 48 claims not at issue in this proceeding. In addition, the '987
27 specification has spawned at least 7 other patents. These numerous other claims may explain the
28 alleged commercial success of SanDisk's products, and have not been addressed at all by
SanDisk's opposition.

1 the application for the '987 patent was originally filed. This legally insufficient evidence cannot
2 justify an inference of non-obviousness. *See Newell Companies*, 864 F.2d at 768-69 (strong
3 showing of obviousness, including reference not cited during patent prosecution, overcomes even
4 proof of a highly successful product).

5 SanDisk's evidence of the failure of others to develop competing technologies *after*
6 SanDisk allegedly conceived and reduced to practice the '987 patent is also irrelevant. As clearly
7 stated in the statute, obviousness is judged "*at the time the invention was made*," not years later as
8 SanDisk appears to contend. 35 U.S.C. § 103(a). The *prior* failure of others is a relevant
9 secondary consideration because it indicates that "others in the art have attempted to solve the
10 same problem and have not arrived at the solution claimed by the patent in suit." *Reeves*
11 *Instrument Corp. v. Beckman Instruments, Inc.*, 222 F.2d 263, 272 (9th Cir. 1971). Unfortunately
12 for SanDisk, Dr. Hsia had earlier arrived at the same solution claimed in claim 10. The later
13 efforts by Intel, Samsung and Toshiba to develop competing memory products are irrelevant to
14 the obviousness inquiry.

15 Finally, SanDisk mischaracterizes its licensing program in an ineffective attempt to
16 demonstrate acquiescence by others in the validity of the patent. All of the licenses cited by
17 SanDisk cover not only the '987 patent, but SanDisk's *entire patent portfolio* related to integrated
18 circuit and flash memory products. *See Auclair Decl.*, Exs. A-C. In addition, all of the licenses
19 cited are broad cross-licenses, involving reciprocal grants to SanDisk by the other companies of
20 their own patent portfolios. They are not, as SanDisk appears to imply, simply licenses for the
21 '987 patent. Such licenses are readily explained, not by the nonobviousness of claim 10 of the
22 '987 patent, but by sound business judgment. *See EWP Corp. v. Reliance Universal, Inc.*,
23 755 F.2d 898, 907-08 (Fed. Cir. 1985) (questioning the value of evidence of a successful
24 licensing program, particularly where there are other reasons unrelated to obviousness that may
25 explain the success of such a program). The broad scope of these licenses as well as their
26 reciprocal character indicates the marginal relevance of such evidence.

27 Thus, SanDisk has failed to meet its burden of showing that relevant evidence of
28 secondary considerations weight against a finding of obviousness. At a minimum, claim 10 is

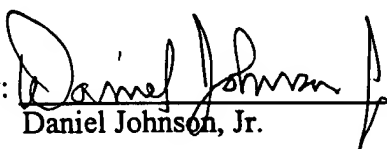
1 invalid under 35 U.S.C. § 103.

2 **IV. CONCLUSION.**

3 SanDisk's opposition fails to raise any triable issues of material fact. Therefore, this
4 Court should grant Lexar's motion. It is clear that Dr. Hsia's notes, which incorporated his patent
5 and various articles, and which was taught to graduate students at Santa Clara University in the
6 mid '80s and disclosed at an International Conference in China in 1984, clearly anticipates each
7 element of claim 10 and thus claim 10 is invalid. SanDisk's attempt to create a triable issue of
8 secondary considerations to defeat Lexar's obviousness argument also fails as a matter of law.
9 Under either § 102 and § 103, claim 10 is invalid.

10 Dated: February 25, 2000

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13
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15 21165/00401/DOCS/1006698.1

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PALO ALTO

Claim 10 of the '987 Patent	Court's Claim Construction Order	Prior Art Hsia's Lecture Notes Exhibit G
<p>10. A method of operating a computer system including a processor and a memory system, wherein the memory system includes an array of non-volatile floating gate memory cells partitioned into a plurality of sectors that individually include a distinct group of said array of memory cells that are erasable together as a unit, comprising:</p>	<p>"The term 'floating gate' in the preamble of claims 1, 10 and 35 forms the antecedent basis for the use of the phrase 'memory cells' in the body of these claims and their dependent claims. The term is therefore a substantive limitation on the claims."</p> <p>"'Partitioned' refers to either logically dividing or physically dividing the memory into a plurality of sectors. When the patent refers to the memory array being 'partitioned' into sectors it is not necessarily referring to the physical division of the memory into sectors such that each sector must be physically separated from the adjoining sectors.</p>	<ul style="list-style-type: none"> • Hsia's Lecture Notes disclose the use of either MNOS or floating gate technology for the non-volatile semiconductor memory. <p><u>LEX 08583:</u> Discussion re Process Technology: NVSM (non-volatile semiconductor memory) --MNOS --EEPROM (floating gate)</p> <ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pdts. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses an array of memory cells (e.g. the memory wafers) partitioned into a plurality of sectors (e.g. MA's).</p> <p><u>LEX 08568 - 08569:</u> Disclosure and incorporation of the '248 Patent.</p> <p><u>The '248 Patent, Figure 1, Col. 5:36-38:</u> The memory stack 18 comprises a plurality of individual memory wafers 19. On each such wafer are a plurality of array controllers (AC) and memory arrays (MA) 22. In this configuration, eight MA's are accessed in parallel.</p> <p><u>The '248 Patent, Col. 10:8-13:</u> As mentioned above, the memory stack consists of a plurality of individual memory slices. Each silicon memory slice measures 2.82 x 2.82 x 0.015 inches and incorporates 224 non-volatile memory arrays (MA's) arranged in a 16 row by 14 column matrix.</p>

	<p>"A 'non-volatile memory sector' is the basic unit of erase for the non-volatile memory. It is not limited to 512 bytes of user data and 64 bytes of overhead data."</p>	<ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pdts. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses that the basic unit of erase is a "block," which is a subset of the memory wafer.</p> <p><u>LEX 08568 – 08569:</u> Disclosure and incorporation of the '248 Patent.</p> <p><u>The '248 Patent, Col. 6:12-13:</u> The ERASE command erases a block of 4096 consecutive words of data.</p> <p><u>See Table 1, Col. 7:10-28:</u> Subsector = 32 words = 64 bytes Sector = 256 words = 512 bytes Block = 4096 words = 8K bytes</p> <p><u>The '248 Patent, Col. 9:7-11:</u> The sequence of addressing an AC and then two MA's is performed a total of four times by the memory stack controller unit and results in access to eight MA's representing a data block of 4096 words.</p>
<p>providing said memory array and a memory controller within a card that is removably connectable to the computer system, said controller being connectable to said processor for controlling operation of the array when the card is connected to the computer system,</p>		<ul style="list-style-type: none"> • Hsia's Lecture Notes disclose that the memory system can be on a card that is removably connectable. <p><u>LEX 08543:</u> A Total System Reconfigurable Circuits, shown on a 3-inch pluggable card.</p>

<p>partitioning the memory cells within the individual sectors into at least a user data portion and an overhead portion,</p>	<p>"Each non-volatile memory sector must have at least one user data portion <u>and</u> one overhead data portion, but is not limited to only one data user portion and only one overhead data portion."</p>	<ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pdts. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses the option of partitioning the memory cells such that an overhead data (e.g. error detection code) can be stored within the memory "blocks".</p> <p><u>LEX 08568 – 08569:</u> Disclosure and incorporation of the '248 Patent.</p> <p><u>The '246 Patent, Col. 9:67 – Col. 10:5:</u> A possible option which may be utilized in the memory stack controller unit is an error detection, coding and correction (EDAC²) unit coupled with an error memory file. Such an EDAC² unit will not only increase system reliability by correction of single bit transient or steady state errors, but will expedite location and reconfiguration of defective memory components.</p> <p>Also, See Figure 5 of the '248 Patent, showing the placement of EDAC².</p> <p><u>LEX 08553:</u> Hsia's Lecture Notes, which incorporate and discuss an article authored by Hsia, entitled "Adaptive Wafer Scale Integration," include the entire content of the incorporated reference. <i>See Ultradent Pdts. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997).</p> <p>See Figure 7 of the Article, which shows storing both user data and "code bits" in the memory array.</p>
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<p>causing the controller, in response to receipt from the processor of an address in a format designating at least one magnetic disk sector, to designate an address of at least one non-volatile memory sector that corresponds with said at least one magnetic disk sector,</p>	<p>"The terms 'designate' and 'generate' refer to the step of identifying the address of the non-volatile memory sector selected by the controller. 'Generate' as used in claims 1, 10 & 35 does not mean to cause the controller to execute a computer code to create such an address."</p> <p>"A non-volatile memory sector may correspond to one or more magnetic disk sectors."</p>	<ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pds. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses that the memory system receives magnetic disk sector addresses (e.g. track and sector) and designates an address of the non-volatile memory sector.</p> <p><u>LEX 08568 – 08569:</u> Disclosure and incorporation of the '248 Patent.</p> <p><u>The '248 Patent, Col. 8: 29-35:</u> The address decoder utilizes track and sector addresses along with the contents of the word register (WCR) to generate virtual addresses for each data block and sector within the memory stack.</p> <p><u>The '248 Patent, Col. 5: 56 – 65:</u> The integration of the memory stack requires a storage of a unique address code in the associative memory of each operating array controller circuit on the memory slices. The physical address of each operable MA is previously stored in a nonvolatile section of the operating AC circuit. An address table is used to translate the data word address from the computer into the physical address of the MA.</p>
<p>either writing user data to, or reading user data from, the user data portion of said at least one non-volatile memory sector, and</p>		<ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pds. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses writing and reading user data.</p> <p><u>LEX 08568 – 08569:</u> Disclosure and incorporation of the '248 Patent</p>

		<p><u>The '248 Patent, Col. 6: 47-63:</u> Two WRITE operations are permissible: One (BLOCK WRITE) in which a clock or several contiguous blocks of data are to be written, and two (SECTOR WRITE) in which a subsector or several contiguous subsectors and sectors of data within a data block are to be written.</p>
<p>either writing to, or reading from, said overhead portion of said at least one non-volatile memory sector, overhead data related either to said at least one non-volatile memory sector or to data stored in the user data portion of said at least one non-volatile memory sector.</p>		<ul style="list-style-type: none"> • Hsia's Lecture Notes, which incorporate and discuss the '248 Patent, include the entire content of the incorporated reference. <i>See Ultradent Pds. v. Life-Like Cosmetics, Inc.</i>, 127 F.3d 1065, 1069 (Fed. Cir. 1997). <p>The '248 Patent discloses writing and reading overhead data.</p> <p><u>LEX 08568 – 08569:</u> Disclosure and incorporation of the '248 Patent.</p> <p><u>The '246 Patent, Col. 9:67 – Col. 10:5:</u> A possible option which may be utilized in the memory stack controller unit is an error detection, coding and correction (EDAC²) unit coupled with an error memory file. Such an EDAC² unit will not only increase system reliability by correction of single bit transient or steady state errors, but will expedite location and reconfiguration of defective memory components.</p> <p>Also, See Figure 5 of the '248 Patent, showing the placement of EDAC².</p>

